REPUBLIC OF SOUTH AFRICA

A Framework for Implementing Non-Point Source Management Under the National Water Act

A Discussion Paper

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&
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PREFACE

During 1997 the government published a *White Paper on a National Water Policy for South Africa*, which was followed in 1998 by the National Water Act (NWA) (Act No 36 of 1998). Together with the Water Services Act (Act No 108 of 1997) this represented the culmination of a substantial reform of South Africa's previous water legislation. These events have necessitated the establishment inside the Department of Water Affairs (DWAF) of a strategic process to ensure policy implementation.

The Directorate: Water Quality Management (D:WQM) has embraced the challenges offered by the policy in terms of implementing source directed controls for the management of both point source and non-point (diffuse) source pollution, in order to achieve the level of resource protection specified by the relevant source directed measures. This encompasses the control of water use (which is defined very widely in the NWA) through statutory authorisation.

As part of its response to the above challenges, the D:WQM intends to develop appropriate tools in the form of guidelines and procedures to facilitate implementation of such source directed controls However, the D:WQM has realised that there has been a need to examine a number of considerations related to the NWA implementation process in terms of non-point source management. This discussion paper, based on interviews with selected stakeholders in the water quality management sector, explores these considerations and suggests a framework for the non-point source aspects of the policy implementation process. The drafting of the paper was funded by the Water Research Commission.

It should be recognised that DWAF is in the process of developing a national water resource strategy (NWRS), as required by the NWA. The NWRS will include, *inter alia*, guidelines and procedures for strategies in various sectors of integrated water resource management. The framework presented here should make it possible to develop such a set of guidelines/procedures for non-point source pollution management, i.e. the national non-point source management strategy (NNPSS) component of the NWRS. The next step would be to formulate and initiate the NNPSS itself.

Stakeholders and other interested and affected parties are invited to comment on this discussion paper. Such comments would be welcomed as primary inputs into the development of the NNPSS, thereby contributing directly to the NWRS formulation process. Your comments and/or proposals should be sent to The Director: Water Quality Management, Department of Water Affairs and Forestry, Private Bag X313, Pretoria 0001.

It should be noted that this discussion paper is part of a series of discussion documents being published by the D:WQM during the course of the development process of the NWA, as well as during its implementation process.

ACRONYMS

CMS	Catchment Management Strategy
DCD	Department of Constitutional Development
DEAT	Department of Environment Affairs and Tourism
DLA	Department of Land Affairs
DME	Department of Minerals and Energy
DoA	Department of Agriculture
DoT	Department of Transport
DTI	Department of Trade and Industry
DWAF	Department of Water Affairs and Forestry
D:WQM	Directorate: Water Quality Management (DWAF)
IDP	Integrated Development Plan
LDO	Land Development Objectives
NNPSS	National Non-point Source Strategy
NWA	National Water Act (Act 36 of 1998)
NWRS	National Water Resource Strategy
RQO	Resource Quality Objectives
WARMS	Water Authorisation Management System
WMA	Water Management Area
WRC	Water Research Commission
WSDP	Water Services Development Plan
WTW	Water Treatment Works
WWW	Waste Water Works

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1. INTRODUCTION

1.1 Background to the Project

The general review of South Africa's Water Law, started in 1995, has culminated in the publication of a *White Paper on a National Water Policy* (DWAF, 1997), followed by the promulgation of the new National Water Act (Act 36 of 1998). The Act was purposefully formulated as a "framework" act, to minimise the complexity of technical details and to achieve economy of drafting time and effort. The White Paper and the Act necessitated the establishment (and maintenance) inside DWAF of a strategic process for Policy implementation.

This process is currently, *inter alia*, focussing on translating the requirements that stem from the detailed principles and the framework components of the Act, into both *resource directed and source directed statutory measures*. The resource directed measures enable the determination of the level of protection of water resources required by law, and give effect to this level of protection by setting management objectives in the resource. Source directed measures include the prevention and control of both point and non-point source pollution and the control of water use (defined broadly to include land uses with an impact on water resources) through statutory authorisation. Both resource and source directed measures form important statutory tools in the process of catchment management as prescribed by the Act.

The Directorate: Water Quality Management (D:WQM) intends to develop appropriate tools in the form of strategies, guidelines and procedures documents to facilitate the implementation of such source directed measures[1]. A review of the "*General and special effluent standards*" has been started. It is intended to also review the manual on "*Procedures to assess effluent discharge impacts*" (DWAF, 1995).

The D:WQM has identified a clear need to develop a similar "procedures manual" for the management and authorisation of non-point source pollution. However, the D:WQM realised that there was a need to examine a number of considerations related to the implications of the general National Water Act implementation process for non-point source management, before the terms of reference for such a "non-point source procedures manual" could be finalised. The D:WQM therefore proposed the development of a discussion paper, based on a series of interviews with relevant officials inside DWAF, as well as with representatives of selected stakeholders in the water quality management sector to address these considerations.

Consequently, Professor André Görgens of the University of Stellenbosch was asked by D:WQM to convene a small team, including Dr Guy Pegram and Mr Gavin Quibell, to develop this paper. D:WQM approached the WRC for funding of this study as an urgent consultancy. This document represents the output of this process.

1.2 Objectives of the Paper

The primary objective of the project was:

> *To outline a terms of reference for developing the strategies, procedures and guidelines to implement non-point source management under the National Water Act (Act 36 of 1998).*

However, the legal complexity of non-point source management in South Africa, first required the formulation of a framework for its implementation. This framework involved the distillation of a number of elements, including:

- the lessons learned from past experience with non-point source management in South Africa;
- the legislative requirements of the Constitution and the National Water Act;
- the legislative provisions for non-point source management under the National Water Act;
- the characteristics of the priority non-point sources requiring management; and
- the social, economic, technical and institutional considerations for non-point source management.

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[1] Mining and dense settlements are two examples of land uses for which water quality management guidelines are already being developed.

In order to achieve these objectives, the following tasks were performed:

- Review the historical context of water quality management in South Africa in terms of non-point source management, in order to derive principles and lessons learned from the past implementation.
- Scrutinise the requirements of the National Water Act, in terms of non-point source management.
- Evaluate the applicability of alternative non-point source management measures, with particular consideration of the provisions of the National Water Act.
- Provisionally evaluate non-point sources by sector as candidates for national water quality management prioritisation.
- Sketch the processes for promulgating statutory non-point source directed measures, recognising the appropriate levels of resource protection in different water management areas.
- Explore authorisation procedures for non-point source control and enforcement at the catchment level.

CHAPTER 2 : THE WATER QUALITY MANAGEMENT CONTEXT IN SOUTH AFRICA

2.1 Introduction

The broader context within which water quality management occurs, largely determines the viability and success of measures to control non-point source pollution in South Africa. This context is not only determined by current policies with respect to water resources management, but also by the evolution of these policies over the last few decades, as well as the wider institutional and socio-political environment in the country as a whole. A critical component of this context is also the lessons learnt from our past experiences, and how these may influence grassroots engagement of the non-point source management process. Non-point source strategies or procedures must be tailored to fit this context.

This chapter outlines this wider context and how this may affect the implementation of procedures to manage non-point sources in South Africa. This is done by:

- Outlining the history of water quality management in South Africa, and the lessons learnt in the evolution of our current policies.
- Outlining DWAF's broader policies towards water resources management in general, and specifically towards water resource protection.
- Outlining the wider socio-political context within South Africa, and how this may affect non-point source management.
- Providing a generic set of principles which should guide the process of identifying non-point source management procedures.

2.2 Lessons Learnt from the History of Water Quality Management in South Africa

Perhaps the earliest attempts to manage water quality in South Africa were tribal laws that governed where people should take water for drinking purposes, should bathe and should water their livestock. This simple approach to water quality management had the advantage that it was community based, was easily understood, was implemented by the entire community in their day-to-day livelihood, and the benefits accrued to those responsible for implementation (advantages which a number of policies are striving to achieve even today). However, this simple approach, in spite of its advantages, is clearly inappropriate for a more modern South Africa, with many more communities scattered along its rivers, and with a host of other activities contributing to the overall pollution load.

The Union Health Act

In answer to this changing context, the first national legislation to manage water quality was promulgated in 1919. The Union Health Act (Act 36 of 1919) gave the local health officer the responsibility to ensure that the "best known, or most practical measures" were used to dispose of point source effluent on land. This Act created non-point sources from point sources, some of which are still impacting on water quality today. In addition, while this Act devolved decision-making down to a local level (something which is supported by our current Constitution), it did not specify national standards to control the disposal of effluent, and did not recognise non-point source impacts on the water resource.

The Water Act of 1956

By the early 1950s, growing demands for water made it clear that effluent reuse would have to be considered (Van der Merwe and Grobler, 1990). This lead to the promulgation of the Water Act of 1956 (Act 54 of 1956), which required that all effluent had to be returned to the water body from which it was originally abstracted. Once again the effects of non-point sources were ignored in this legislation. However, the provisions of this Act highlighted a number of important issues. Most importantly, recognising that effluent returned to the water environment could lead to a deterioration in water quality, this Act required that all effluent comply with given quality standards. These standards were promulgated in 1958, and required that all effluent comply to Uniform Effluent Standards, which comprised the General Effluent Standard, the Special Standard and later the Special Standard for Phosphate. If dischargers were complied with the standards set, they did not need to apply for permits, and permits were only issued in cases where the standards would be exceeded.

This approach offered several advantages:

- It was administratively very simple, and could be implemented at a regional level with little input from the head office water quality management component.
- Dischargers knew what was expected of them, and could design pollution management works accordingly.
- The system was also uniform across the country, but still recognised that some water resources needed a higher degree of protection, and were hence specified as Special Standard areas.

These provisions were put to good use when specifying phosphate sensitive areas for the Special Standard for Phosphate. However, while these advantages certainly streamlined the control of point sources, the Act presented a number of disadvantages:

- It did not address non-point sources.
- It treated all source types identically, in spite of obvious differences in the make-up and impacts of their effluents, technology available for treatment, and the differing economies of the sources.
- Standards were based on technology which soon became outdated.
- It did not allow for specifying different standards for sources where the volume of effluent or number of pollution sources warranted more stringent water quality management.

The Water Amendment Act

The last point meant that the site-specific requirements of the water environment could not be catered for. It was partly to address this concern, and to make provision for non-point source management that the Department of Water Affairs and Forestry promulgated the Water Amendment Act (Act 96 of 1984). This Act gave the Department wider powers to address any activity that could render the water resource less fit for use, and allowed for the setting of site-specific standards or management practices to manage pollution. As such the Act, for the first time, made provision for managing non-point sources of pollution. More importantly, the Act allowed the formulation of site-specific standards based on both the characteristics of the source and on the receiving water resource. This flexibility meant that the provisions of this Act rapidly became the preferred legislative means for managing both point and non-point source pollution in most regions.

The policies of the early 1990s

Clearly, this process had to be subject to overarching policy principles, which governed how site-specific standards may be applied. This lead to the adoption of the Receiving Water Quality Objectives (RWQO) approach (described in Van der Merwe and Grobler, 1990), which together with a pollution prevention approach for hazardous pollutants, was widely recognised as DWAF's approach to water quality management during the late 1980's and early 1990's. This approach aimed at developing site-specific standards (waste loads) that ensured the water resource remained fit for its various uses. More specifically, the RWQO approach was based on the assimilative capacity of water resources. This was defined as the difference between the current concentrations and the receiving water quality objectives.

However, it was recognised that widespread application of the RWQO approach may lead to the deterioration of the water resource to a point where it was just fit for use (i.e the assimilative capacity would all be allocated). The Department, therefore, advocated an "anticipatory or precautionary" approach to water quality management. As such, permitting followed the hierarchy of:

1. Source reduction (by voluntary actions)
2. Application of minimum effluent standards (the Uniform Effluent Standards)
3. Waste load allocation based on the RWQO approach
4. Exemption from these standards only as a last resort

This approach was outlined in detail in the Department's 1991 policy statement (DWAF, 1991). While this approach was predominantly focussed on point sources, it too provides several lessons for non-point source management.

The main advantage of the approach was that site-specific standards based on the particular needs of the water resource and water users could be established. These standards could also take the source-specific

characteristics (economics and technology) into account. However, the approach held several significant disadvantages. The hierarchy outlined above, together with the need to calculate the pollutant load and its effect in the receiving water placed an enormous load on the regional offices. This slowed the permitting process and lead to a significant backlog in permitting.

The application of the RWQO's approach provides a number of insights which are particularly important to this study. Firstly, if the RWQO approach was difficult to realise with point sources, it would be even more ambitious for non-point sources, where the calculation of pollutant loads and the effects of management practices on these loads is even more vexatious. Secondly, the variable hydrology and rainfall of most of river systems made it difficult to define a risk of exceeding receiving water quality objectives for point sources. This would be even more complicated for non-point sources, where the rainfall itself may drive both the volume and quality of the runoff. Lastly, many polluters saw the assimilative capacity as a license to pollute. This latter perception was in fact supported by statements which indicated that "*This assimilative capacity is part of the water resource, and must be judiciously managed and equitably shared by all water users*"(DWAF, 1991).

In 1995 DWAF again expanded on its precautionary approach to water quality management (DWAF, 1995). Most importantly, this document again emphasised a pollution hierarchy whereby dischargers would firstly investigate all means to prevent the introduction of waste to the water environment. Only if this was not technically feasible or economically viable, would consideration be given to adopting the specified minimum standards, or calculated standards based on the RWQO approach, where these standards were not stringent enough[2]. This pollution hierarchy recognised the current global trend with respect to pollution management (i.e pollution prevention and the principles of the ISO 14000 series). It is still considered as the basis for water quality management under the new National Water Act.

In summary, the following lessons for non-point source management may be learned from the past experience of water quality management in South Africa:

- The non-point source management approach should be as simple and streamlined as possible.
- Site-specific management should only be adopted where absolutely necessary.
- Ensure that the intent of the management approach is clear to polluters.
- Match management approaches to the non-point source character (i.e. source/sector specific).

2.3 The Current Legislative and Policy Environment

The decision in 1994 to revise the water law in South Africa, to bring it in line with the constitutional requirements for equity, provided the opportunity to completely revise the policy and subsequently the legislation governing water quality management. The new policy and legislative context has the greatest impact on the approach towards non-point source management, and hence on this project. Most importantly, it allows the DWAF to address many of the concerns raised above. This section outlines the current approach towards water resource protection (and utilisation), and highlights the demands this places on this project.

The White Paper

One of the most important milestones in the revision of the Water Law in South Africa was the publication of the *White Paper on A National Water Policy for South Africa* (DWAF, 1997). This document highlighted some overarching policy considerations, which were later taken up into the National Water Act. These policies must underlie the approach to non-point source management and are critical to this study. The most important components of these overarching principles, at least for this study, are the requirements to ensure environmentally sustainable use of water resources, but also of the need to ensure protection of the water resource for the "optimum social and economic benefit" of the country. Coupled with these was the need for a transparent and participative approach to water resources management, and the need to provide for a "Reserve", which is that quantity and quality of water required for basic human needs and to maintain the sustainability of the aquatic ecosystem.

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[2] A document similar to this, but focussed on non-point source management would be the goal of the future project defined by the ToR in Chapter 7.

Resource-and-source directed measures

Within the ambit of these overarching principles, the White Paper also indicated that a combination of resource-directed and source-directed measures would be used to protect the water resource. These measures have now been taken up into the National Water Act (Act 36 of 1998). These provisions dictate how non-point sources will be managed and are therefore briefly discussed here. A more detailed outline of the provisions for source-directed controls is provided in Chapter 4 of this document.

Resource-directed measures aim to provide an appropriate level of protection for different water resources. This will be done within a water resources classification system. This system allows for the ecological classification of water resources into six classes (A to F), describing relatively pristine to highly degraded (ecologically dysfunctional) resources. These current status ecological classes may be combined with the socio-economic importance of the resource into management classes reflecting the required level of protection. These management classes will focus management attention on sensitive or degraded systems, and may indicate standards and practices required to control pollution at source. In some cases, they will highlight the need for remediation, either of the water resource itself or sources causing problems.

The classification system will also establish Resource Quality Objectives (RQO) for each water resource. These RQOs specify numeric and narrative objectives for different water bodies. This is done in terms of the requirements of the "Reserve", and in terms of the needs of other users. These RQOs therefore set the line in the sand with respect to water quality management goals, and shift the emphasis of water resource protection into the water resource, in a similar way to the RWQOs approach. Perhaps most importantly, the National Water Act (NWA) requires that all water resources management practices "give effect" to these RQOs and the water resources classification system.

Section 12(2)(b)(iii) of the NWA indicates that the classification system may "in respect of each class of water resource - set out water uses for instream or land-based activities which activities must be regulated or prohibited in order to protect the water resource". This has profound implications for non-point source management, because it provides a mechanism for linking the land use activities requiring source directed management to the level of protection associated with each management class. This may be reinforced by defining RQO related to "the regulation or prohibition of instream or land-based cativities which may affect the quantity of water or quality of the water resource;" under Section 13(3)(h) of the NWA. Although these provisions may provide the basis of non-point source management, greater clarity is required about the constitutionality and enforceability of including land-based activities in the definition of resource-directed measures.

Chapter 3 of the NWA on *Water Resource Protection*, also outlines provisions for "pollution prevention". These indicate that all measures to protect water resources from polluting activities on land or in the resource must be taken. However, little guidance is given on what these measures may include. In addition, apart from the general requirement to "give effect" to the RQO and resource class, and the indication that source-directed controls may differ between resource classes, the Act provides little guidance as to how these measures should affect the management of non-point sources.

A wide range of regulatory, economic and/or persuasive measures are required to control human impacts on water resources. These source-directed measures include statutory requirements or incentives for achieving end-of-pipe effluent discharge standards, implementing on-site management practices to control diffuse impacts, and performing instream mitigation and rehabilitation.

Statutory requirements to enable source directed control are based on the authorisation of water use. Water use is broadly defined in the NWA, to include all activities that are likely to impact detrimentally on a water resource. Granting of water use authorisations must consider equity, sustainability and optimal beneficial use (efficiency). Certain water uses must be authorised in accordance with stipulated conditions or pertinent regulations, as well as being consistent with the relevant catchment management strategy, and may therefore differ between water resources, water resource classes, and geographical areas.

These provisions are also all subject to public consultation procedures, as well as to the overarching policy principles discussed above. However, once again the Act provides little guidance as to when these different provisions would be appropriate to manage non-point sources of pollution. What is interesting is that the NWA does not specifically differentiate between point and non-point sources of pollution, and in fact allows for the development of source-specific procedures which address both point and non-point source pollution from the source. This will promote the integrated vision of water quality management, and will prove to be administratively simpler.

Water Management Strategies

Chapter 2 of the NWA makes provision for the development of *Water Management Strategies*. These are a National Water Resource Strategy, which provides the framework for the protection, use, development, conservation, management and control of water resources. Catchment management strategies give effect to this national strategy within specified areas, and seek co-operation and agreement on the water resources management from stakeholders in the area. The NWA also indicates that all water resources management activities must give effect to these strategies. Unfortunately the development of these strategies is still in its infancy and the impacts that these strategies will have on non-point source management procedures is not clear. However, these provisions signal a clear intention to devolve water resources management to a regional or catchment level, under national guidance.

The White Paper and NWA provide the overall framework within which procedures to manage non-point sources must be developed. It outlines a number of requirements and provisions to ensure that non-point source management can address the problems of the past. However, the NWA was deliberately written as a "framework" act, and consequently provides little direct guidance for developing these procedures. The framework nature of the Act is, nevertheless, flexible, which allows this study to develop an approach that is both consistent with the Act, and which engages the lessons of the past. Be this as it may, the wider socio-political context of South Africa will also determine the success and viability of non-point source management procedures and must be considered in the development of this approach.

2.4 The Broader South African Context

Non-point source contamination takes place within the social, political, institutional and economic environment of the country. These determine the location, extent and amount of non-point source contamination, and therefore also influence how these sources are managed. However, these issues also influence the viability of management approaches, procedures and practices. This section provides a brief outline of this broader context, and how it may affect procedures to manage non-point sources of pollution.

One of the most profound changes in South Africa has been the advent of democracy in 1994. This provided the opportunity to re-examine legislation and governance to ensure equitable use of resources. Most government agencies, including DWAF, have therefore been actively involved in developing and implementing new legislation. This has placed significant demands on both human and financial resources, which limits resources available for non-point source management. This demands that, as much as possible, management of non-point sources should be devolved to the source itself, which is consistent with the requirements of the polluter pays principle. This, however, requires that different source types are provided with clear guidelines as to what is expected of them. Non-point source management should therefore be both procedurally and administratively simple. This will become even more critical as the responsibilities for water quality management are devolved down to catchment management agencies which may not be fully staffed by personnel with significant experience in water quality management.

However, while new policies in South Africa recognise the need for environmentally sustainable management, the need for development is seen to outweigh any potential environmental consequences. Growth and upliftment within the GEAR programme is therefore regarded as the primary objective of the new government. This commitment to the GEAR programme is likely to grow under the leadership of President Mbeki. This will affect the political and public support for non-point source control, and

how DWAF may balance development and protection of the water resource, as well as the attention polluters give to non-point source management[3]. This makes it even more important to include the polluting sources in the development (and possibly financing) of non-point source management procedures. Inclusion of the polluting sources in the development of these guidelines also satisfies the need for public participation, and can reduce the resources required from DWAF. However, this also requires that the methodologies to develop source-specific management practices, be clearly spelt out.

However, the future for non-point source management in the new South Africa is not all bleak. South Africa is now once again part of the global economy, and South African firms wishing to trade internationally will need to demonstrate environmentally friendly management systems. This provides the opportunity to link non-point source management procedures with international standards like the ISO 14 000 series which aims to support pollution prevention in line with socio-economic development. Similarly, the pollution management hierarchy outlined in Section 2.2 is compatible with international requirements for cleaner technology and pollution prevention. The non-point source management procedures should exploit these links to gain support from the polluting sources.

2.5 Guiding Principles for An Approach to Non-point Source Management

A number of principles can be distilled from the lessons learnt during the evolution of South Africa's approach to water quality management, as well as the current legislative and policy environment, and the wider South African context. These should guide the formulation of an approach towards non-point source management, and underlie the recommendations made in this report. The following principles are suggested:

- Recognise the requirements of the Water Resources Classification system, and the "Reserve".
- Make special provision for cases where the Resource Quality Objectives are exceeded.
- Be administratively simple (i.e. minimise "red tape").
- Be procedurally simple (i.e. be easy to implement).
- Devolve decision-making to the lowest possible level, while maintaining a national approach.
- Recognise the distinctive technological and economic characteristics of different source types.
- Include the pollution management hierarchy, and principles of the ISO 14 000 series.
- Recognise the need to balance development and protection.
- Promote equity, sustainability and efficiency considerations.
- Incorporate flexible economic instruments, to support statutory non-point source controls.
- Include opportunities for meaningful public participation.
- Provide clear guidelines for sources to promote self-regulation.

[3] The decision about whether to use best available technology (BAT) or best available technology not involving excessive economic cost (BATNEEC) must be negotiated with the relevant sectors.

3. NON-POINT SOURCE MANAGEMENT PRIORITIES

3.1 Priority Non-point Source-Related Water Quality Concerns

The previous chapter has indicated many of the previous problems that hindered non-point source management in South Africa. There is a need to prioritise sectors in order to focus the limited resources available and develop appropriate source-specific approaches for non-point source management. The prioritisation of sectors and activities for non-point sources management under the NWA, should be based on the impact of different sectors (and subsectors) on the priority water quality concerns in South Africa, at either a national or regional level.

The critical non-point source related water quality concerns in South Africa may be grouped into the following categories:

- *Pathogen* contamination of streams causes public health problems, particularly in more densely populated under-serviced settlements in and around urban areas.
- *Metals and toxins* from urban areas, transport corridors and agricultural land uses (pesticides) pose a threat in certain parts of the country (although little monitoring has been done).
- *Salinisation* has significant economic and social impacts in many of the central, western and south-eastern parts of the country, where extensive commercial irrigation occurs.
- *Eutrophication*, caused by excessive nutrients, occurs in impoundments throughout the country (many are point source in nature) with associated impacts on aquatic ecology, water treatment and recreation.
- *Sedimentation* of rivers and impoundments is a natural phenomenon that may be accelerated by poor land management in agricultural and peri-urban areas.

This list represents a rough order of priority, related to the known extent and severity of the impact. However, the effects of pathogen, metal and pesticide contamination is poorly understood due to inadequate monitoring.

3.2 Brief Characterisation of Non-point Sources by Sector

Non-point source management is largely focussed on land use, rather than water use, and should be conducted within the context of catchment management. Therefore, the appropriate point of departure for a non-point source authorisation framework is a characterisation of different non-point sources, in terms of:

- the risk and severity of non-point source impacts relative to the priority water quality concerns,
- the extent of the problem nationally or regionally,
- the technical, economic, social and institutional possibilities for management, and
- the mandate for land-use management in South Africa.

Many of these characteristics are sectorally oriented, which implies that non-point source management is likely to be sectoral. At this point, it is worth reiterating the three objectives around which the National Water Policy is developed, namely equity (and redress of past discrimination), sustainability and efficiency (optimal beneficial use).

The following non-point source characterisation scheme is developed by sector, with further subdivision where the subsectoral non-point source character (as outlined in the four points presented above) may influence management, taking consideration of equity, sustainability and efficiency. The relative priority of different subsectors for non-point source management is indicated using * or **[4]. An attempt has been made to represent all the major non-point source groups, but the list is not necessarily exhaustive.

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[4] * implies that non-point source management is required, although this may not necessitate statutory control; ** implies a high priority to require statutory non-point source control.

Agriculture

Commercial agriculture contributes to non-point source impacts on sediment, salinity and eutrophication, and to a lesser extent pathogen, metals and pesticide contamination in many rural parts of South Africa. This category does not include subsistence farming and livestock in traditional rural settlements. Agriculture can be subdivided into the following groups:

- Livestock grazing
- Dryland crops*
- Crop irrigation*
- Pasture irrigation (for intensive grazing)*
- Emerging farmers (dryland or irrigation)
- Confined animal facilities (feedlots, dairies, piggeries, chicken houses)**

This sector is largely the mandate of the Department of Agriculture, which has land management programmes. Care must be taken not to exceed the mandate for water management when developing non-point source measures. This is not as important a consideration for irrigated areas, because management may be linked to the water abstraction. Management of soil erosion, fertiliser application and pesticide use should be the focus of non-point source management for crops, while irrigation scheduling for salinity management must be addressed for irrigated areas. Management requirements for emerging farmers may be waived in the short term, in line with the need to redress past discrimination.

Confined animal facilities should be prioritised for management in particular water management areas (WMAs) or catchments where the numbers pose a threat to the water resources. They can be managed by containing storm and wash-water runoff, because these are small concentrated non-point sources.

Forestry

Forestry has a greater impact on streamflow reduction than on water quality, except during and immediately after harvesting, and to some extent planting, when increased soil erosion and sedimentation may occur. Access roads also typically cause soil erosion, while application of pesticides may contaminate local resources. The following forestry groups should be considered:

- exotic plantations*
- indigenous forests (harvesting of timber)
- woodlots

Management of forestry is the mandate of DWAF, and therefore co-ordination with the relevant Directorates is most appropriate. Woodlots are generally associated with underdeveloped rural communities, and thus should not be the focus of management attention in the short term. The impacts from well managed indigenous forests are relatively limited. Management attention should be most concentrated during the harvesting period and on pesticide management of exotic plantations.

Industry

Industrial production areas can cause severe contamination, particularly in terms of salinity, metals and nutrients, depending upon the manufacturing processes. The following generic groups may be used:

- energy production (coal, nuclear, gas, hydro, etc.)**
- heavy industry (metals, petro/chemicals, etc.)**
- light industry (electronics, textile, etc.)*
- natural resource processing (paper and pulp, food and beverage, etc.)*

These groups require further subdivision into manufacturing processes for non-point source management. Stormwater washoff of accumulated waste or stock-piled material and atmospheric deposition of air emissions should be the target for management, particularly from energy production and heavy manufacturing industries. Although light and natural resource processing industries are likely to be the focus of point source discharge authorisations, they are not necessarily a short-term priority for statutory non-point source management.

Mining

Mining activities can cause severe water quality problems, both during the entire life-cycle, i.e. during operation and after closure. Salinity and metals are the main water quality concerns associated with mining, depending upon the type of mineral and the extraction process (open cast or under-ground):

- coal mining**
- metal extraction (gold, platinum etc.)**
- mineral extraction (asbestos, salt, etc.)**
- quarrying, sand-winning and gem-stones (diamonds)**

All mining activities should be subject to statutory control (authorisation) due to their potential impacts on water quality, with coal and metal extraction being the highest priority. Isolation of contaminated wash or storm water is the principal approach, which is facilitated by the concentrated non-point source nature of mining activities. Although waste tips may be included under waste disposal, these should be subject to authorisation as part of the mining process where possible, to facilitate an integrated management approach. Regulations have already been developed for the mining sector.

Residential

Human settlements cause severe non-point sources related water quality problems throughout the country, and are particularly associated with pathogens, eutrophication, sedimentation and metals. These can be separated into:

- formal residential (multi-story, single dwelling suburban, township, village)*
- commercial (CBD, suburban)*
- peri-urban informal*
- traditional rural
- residential small-holding
- tourism resorts*
- recreational facilities*

Contamination from residential areas can stem from a number of causes, largely associated with the level and operation of municipal services, as well as storm water washoff, including the construction and development phase of these settlements. However, the physical water quality impacts have their roots in the social and institutional environments, and are thus less appropriate for statutory authorisation, but should be the focus of other non-point source management approaches. DWAF (1999) is currently developing a national strategy for managing the water quality effects from settlements, which covers all but the last two of the above categories.

Local authorities have the mandate for managing municipal services and stormwater systems, and this must be considered. On the other hand, it may be appropriate to use statutory measures to control a particular element or activity that can be shown to have severe direct impacts on a water resource, such as the sanitation or storm-water system.

Transport

Transportation related areas may be associated with significant non-point source impacts, particularly metals, nutrients and salinity associated with movement and storage of materials and deposition of fuel emissions. The main transport groups are:

- highways (intercity and intracity)**
- regional and rural roads
- railways and sidings**
- airports**
- harbours**
- storage facilities (chemical, food, petrochemical)**

The larger transport hubs and corridors should require non-point sources authorisation, but this must be carefully considered against the likely impact on water quality. The focus should be on storm and wash water runoff, as well as failure of storage facilities. Much of this is the mandate of the Department of

Transport, and thus co-ordination may be required.

Waste disposal
The disposal of any waste poses a threat to ground- and surface-water resources, due to its concentration at a site. Any water quality impact may occur, depending upon the waste type. The following generic groupings should be considered:

- hazardous waste**
- general solid waste**
- sludge disposal (WWW and WTW)**
- liquid effluent irrigation**

All waste disposal sites should require authorisation, although this may be done in association with the national, provincial and local government departments tasked with environmental matters. The objective should be to prevent the waste from entering water resources, and restrict rainfall and storm water.

Relatively undisturbed
For completeness, natural and pristine areas under conservation, game-farming or undeveloped should be defined, but these have negligible non-point source impact and are not considered further in this paper.

3.3 Provisional Prioritisation of Non-point Sources for Management

The preceding discussion have highlighted a number of sectors requiring non-point source management. However, the following sectors should be given priority in terms of statutory non-point source related authorisation in the short term (best management practices are available for many of these sectors):

- All waste disposal processes (including collection, transport, handling and disposal sites).
- All mining activities.
- Heavy industrial areas and power generation sites and associated activities.
- Confined animal facilities.
- Major transportation hubs and corridors.

4. NON-POINT SOURCE MANAGEMENT

4.1 Introduction

The National Water Act (Act 36 of 1998) was purposefully formulated as a framework act, to minimise the complexity of technical details and to achieve economy of drafting time and effort. As a consequence, DWAF is currently involved in a policy implementation process, focusing on translating provisions of the Act into implementation strategies.

The White Paper (DWAF, 1997) states that the National Government is "custodian of the nation's water resources and its powers in this will be exercised as a public trust". DWAF is the primary agency responsible for water resources management. In exercising its mandate, DWAF must reconcile, integrate and co-ordinate diverse and often conflicting interests of different stakeholders, within the framework of sustainable and equitable utilisation of South Africa's water resources. However, in promoting non-point source management, care must be taken by the DWAF not to encroach on the mandates of other national, provincial and local government departments. This implies that non-point source management should be grounded in the concept of co-operative governance with the relevant other line function departments (see below).

The new policy also provides for the phased establishment of Catchment Management Agencies (CMAs) to undertake water resources management in defined water management areas. These water management institutions will be responsible for implementing the statutory provisions of the Act, as well as developing catchment management strategies in their water management area (WMA). However, only the Minister and DWAF can establish institutions, delegate powers, or promulgate statutory authorisations, requirements or strategies. It should be noted that in the short to medium term, many of the personnel for these agencies may not be highly skilled, due to the resource limitations in South Africa and the need to "fast-track" previously disadvantaged individuals. This reinforces the need to adopt simple streamlined management approaches.

The Policy promotes a participatory approach to water resource (including water quality) management. This implies that responsibility for water quality management is shared among national, provincial and local government departments, public sector agencies, private sector organisations, community based organisations and non-governmental organisations (NGOs).

Source directed control measures may be affected through a variety of mechanisms, including strategy implementation, statutory authorisations (regulation), persuasive approaches, economic instruments and co-operative governance. Each of these are considered in the following sections, while Figure 4.1 presents a schematic which outlines their interrelationships.

4.2 Water Resource Management Strategies

The National Water Act (Chapter 2) requires the progressive development and establishment of a number of strategies to provide the framework for water resources management at the national and catchment level. These provide the framework for non-point source management.

National Water Resource Strategy

The National Water Resource Strategy (NWRS) as required by the National Water Act (**s5**[5]), gives effect to the need for integrated water resources management at a national level, by providing a framework for water resources management between and within water management areas. The NWRS is established in law and may consist of a number of functional strategies, one of which could be a national non-point source strategy. Alternatively, issue-based strategies with a strong non-point source component may be established as part of the NWRS, such as the strategy to manage the water quality effects of settlements (DWAF, 1999).

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[5] This notation refers to Section 5 of the National Water Act (Act No. 36 of 1998).

Either way, the NWRS provides an opportunity to establish statutory non-point source management requirements in law. These may define the objectives of, and clarify a coherent approach to, non-point source management in South Africa. Key elements would include:

- The relationship to the national resource protection strategy (i.e. the resource classification and Reserve);
- The need to adopt statutory, persuasive and economic instruments for integrated non-point source management;
- Guidance on the way in which co-operative governance should be implemented in non-point source management.

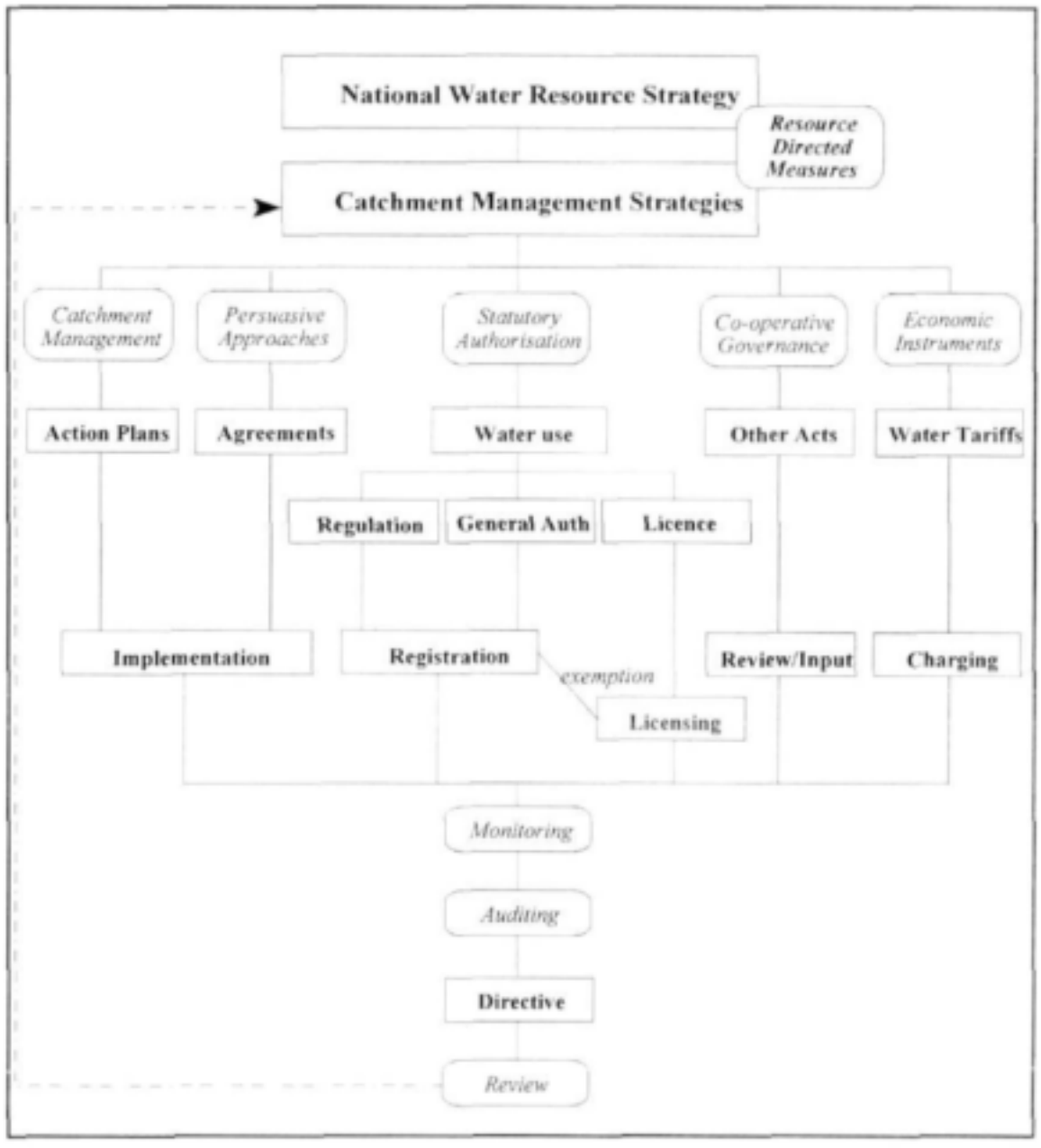

Figure 4.1. Schematic illustration of the non-point source management environment.

At a minimum, the NWRS should include a provision to require a non-point source management strategy (including a situation assessment) as part of the individual catchment management strategies. In addition, the NWRS may specify sectors and/or activities that require non-point source management and possibly the requirements for this management in particular WMAs. The way in which these provisions would

be effected and the relationship between these requirements and the statutory authorisations is not yet clear, and would need further investigation before they could be formulated.

On a more innovative level, the NWRS may specify non-point source sectors and activities for which statutory control measures, including processes, procedures and requirements, must be developed within a given time frame, possibly as a co-operative partnership between DWAF and the relevant sector representatives. Further guidance is required on the intended form of the NWRS, both for publication and as supporting reference material.

Resource directed measures

Water resources classification and resource quality objectives specify the level of protection required for a particular water resource. Their statutory establishment occurs separately from the NWRS or CMS, but they provide the context for integrated water resources management, including non-point source management. The water resources classification system may indicate which land-use activities defined as water uses (see below), require regulation or prohibition for each class of water resource (**s12(2)biii**). This provides a means to relate resource protection to source directed measures. Furthermore, RQOs may also relate to the regulation or prohibition of land-use activities (**s13(3)g**). This explicitly allows the incorporation of non-point source management measures into the determination of resource directed measures. Further investigation is needed to determine whether this is practical or desirable.

The requirements for achieving (or complying) with the objectives need to be set out when establishing the class and RQOs of a particular water resource (**s13(2)**). This implies that the source directed measures (including non-point source management measures) should be developed as part of the determination of the class and RQOs. However, this should be the focus of the catchment management strategy. This apparent anomaly needs to be explored, particularly in terms of the interpretation of the above-mentioned "requirements".

Catchment management strategies

The recognition that water resource management should be performed at a catchment scale, with input from all stakeholders, led to the requirement for catchment management strategies (CMS) to be formulated and established in law (**s8**). This strategy should outline a framework for water resource protection, use, development, conservation, management and control within a water management area, and must be consistent with the national water resource strategy (see Figure 4.1).

The complex and integrated nature of the origin and progression of non-point source impacts implies the need for information at a catchment scale to support non-point source management. Therefore, a key requirement of every CMS should be the formulation of a catchment non-point source strategy, supported by a screening-level non-point source assessment of the entire WMA. This strategy should highlight the priority subcatchment areas and non-point sources (sectors and activities) requiring non-point source management. It should also outline the ways in which non-point source control may be achieved, based on a combination of statutory, persuasive and economic instruments, as well as co-operative governance arrangements. The establishment of the catchment non-point source strategy in law, after extensive stakeholder involvement, provides a tool for the CMA to use in achieving the objectives of non-point source management.

The implementation of the catchment management strategy may be facilitated by the development of an action plan, outlining responsibilities and time frame for implementation (see Figure 4.1).

Water services development plans

The Water Services Act (Act No. 108 of 1997) requires local authorities to develop water services development plans (WSDP), outlining the planned development and provision of water supply and sanitation services within their area of jurisdiction. These plans should be consistent with the relevant CMS, in terms of the impact of these services on the water resources, including water availability and water quality. The WSDP should address non-point source impacts in the environmental evaluation.

Monitoring, auditing and review
The Act requires that these strategies be reviewed at intervals of not more than 5 years. This should be based on monitoring of the status of the water resource and on auditing of the implementation of the strategies. Monitoring and auditing should not only inform an entire strategic review, but should also guide the implementation and refinement of other source directed control measures. This should indicate whether, where and when localised or site-specific measures should be adopted over and above the national, regional or water management area based measures.

4.3 Persuasive Approaches

Often the most effective non-point source control is based on land-use management. However, constitutional mandates, statutory competencies and administrative requirements may make it inappropriate to apply statutory measures to all non-point sources. The influencing of individuals' decision-making through non-coercive and non-economic options can be cost-effective and sustainable, particularly for less severe non-point source impacts. In practice, this is usually the initial approach preferred by DWAF water quality management staff, and as such should be reflected as an important element of non-point source management.

Legal covenants (or contracts) between polluters and/or stakeholders, which formally specifies what each party agrees to take responsibility for, as well as the implications if either party defaults. It may involve extensive public participation and consensus building, particularly where a diverse group is involved. The contract should be legally binding, and may be incorporated into the established catchment management strategy.

Guidelines and voluntary agreements encourage the voluntary adoption of non-point source management measures through public pressure, moral persuasion or advocacy (see below). Appropriate management practices (guidelines) for different land-use activities may be compiled and publicised, particularly for those non-point source types with less severe impacts. Even though they are non-binding, informal commitments between parties can be effective, particularly at the local level where community dynamics are important. These approaches are particularly effective where there are other pressures, such as the international demand for goods produced using environmentally sound practices (e.g. ISO 14 000).

Self-regulation reduces the administrative burden of enforcing non-point source management, the responsibility for regulating or monitoring implementation may be delegated to the representative bodies of subsectors that represent potential polluters. This may be applicable for either statutory authorisations, covenants or voluntary agreements. To prevent non-regulation by default, effective auditing by independent parties or the responsible authority is required.

Advocacy, education and awareness creation about approaches and benefits of non-point sources control supports all other management measures. This is most effective when supported by information dissemination about the severity, causes and effects of the non-point source contamination. Thus the public relations component of water resource management should be emphasised, while public education and awareness programmes and sectorally directed extension efforts should be supported.

Persuasive approaches present the opportunity to encourage sectors to develop their own management approach, particularly if the intention of the DWAF's non-point source management approach is made clear, in terms of the mediu- to long-term priorities. Where a sector has been proactive and developed appropriate management measures, these may form the basis for statutory management measures.

4.4 Statutory Measures

Statutory measures for the control of non-point sources are at the heart of this document. For managing non-point sources, the National Water Act provides a number of possible authorisation and regulatory mechanisms, each of which is appropriate under different circumstances. These mechanisms may be grouped into: *authorising water use, promulgating regulations* and *giving directives*.

4.4.1 Non-point sources as water use

Water use is defined broadly under the Act (**s21**) to include all activities that may have an impact on the resource quality. Non-point sources may be defined as water use through the following clauses (**s21**):

e) engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1);
f) discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit;
g) disposing of waste in a manner which may detrimentally impact on a water resource;

A ***controlled activity*** may be declared by the Minister if *satisfied that the activity in question is likely to impact detrimentally on a water resource* (**s38**), or it has been specified in the Act (**s37**). This is fairly self-explanatory, although the interpretation of "activity" may restrict its application to processes, such as irrigation of land with water containing waste (**s37(1)a**). However, this clause may be appropriate for controlling the specific activities associated with a particular land use, such as fertiliser or pesticide application to agricultural crops, rather than all the processes associated with the land-use activity, such as cultivation of vegetables. The declaration of a controlled activity is likely to be most appropriate for intensive concentrated non-point source activities, such as mining, confined animal facilities and certain storage facilities.

On first reading, ***discharging waste***[6] or water containing waste into a resource through a conduit implies a point source. However, there are situations where discharge from non-point sources is collected and channelled into a conduit, including urban storm-water runoff, irrigation drainage, confined animal facilities and mines. It may be appropriate to use this clause to control these non-point sources, by setting discharge standards (as with point sources) and/or requiring management practices (as with non-point sources).

Finally, ***disposing of waste*** may be interpreted broadly as the application or deposition of any material that may have a detrimental impact on a water resource, even where this is beneficial, such as with fertiliser or pesticide application. Alternatively, it may be interpreted narrowly as discarding waste, which would restrict it to sites used for surplus material, such as mine dumps and landfills. In reality, this clause may be used for most non-point sources where there is purposeful application, deposition or discarding of material, although one of the other water use clauses may be more appropriate in certain circumstances.

It is important to note that all three of these clauses are more suited to defining an activity as part of a land use, rather than the land use itself. This has significant consequences for a suitable approach to non-point source management, particularly in terms of water use authorisations.

4.4.2 Water use authorisations

The Act (**s22(1)**) specifies that a person may only use water -

a) without a licence -
  i) if that water use is permissible under Schedule 1;
  ii) if that water use is permissible as a continuation of an existing lawful use; or
  iii) if that water use is permissible in terms of a general authorisation issued under section 39;
b) if the water use is authorised by a licence under the Act, or
c) the responsible authority has dispensed with a license requirement under subsection 3[7].

Schedule 1 on *Permissible Use of Water* permits discharge of waste or water containing waste, or runoff from any residential, recreational, commercial or industrial site (**s1f**), but this is subject to any other

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[6] Waste is defined in the Act (**s1(1)xxiii**) as *any solid material or material that is suspended, dissolved or transported in water and which is spilled or deposited on land or into a water resource in such volume, composition or manner as to cause, or to be reasonably likely to cause, the water resource to be polluted.*

[7] This refers to the situation where the requirement for a licence is dispensed with, because control is achieved by the grant of a licence, permit or other authorisation under any other law (**s22(3)**).

provision in the Act. This implies that non-point source discharge is permissible, until it is controlled through one of the other statutory mechanisms.

An ***existing lawful water use*** is defined as water use that has taken place any time during a period of two years immediately before the commencement of the Act or the declaration of a controlled activity (**s32**). This has potentially profound consequences for the statutory authorisation of non-point sources as water use, because this may only apply to new non-point source developments.

General authorisations may be made by the responsible authority[8], in order to permit the use of water generally, or in a particular water resource, a particular category of persons, a defined geographical area or a period of time (**s39**). These may be published for non-point sources according to the relevant water uses (in **s21**). Use of water under a general authorisation does not require a licence, but may require specified conditions to be met (see below). A licence may be required where a particular user wants an exemption from these conditions. The proposed general authorisations[9] indicate that activities or premises (land uses) may be specified with general or specific requirements, such as registration, precautionary practices, regulations and monitoring. Thus, general authorisations provide an important mechanism for managing those priority non-point sources which have intermediate level impacts.

Water use licences may be made compulsory by the responsible authority for specified non-point source related water uses in a particular geographic area, where water quality problems are imminent or do already exist (**s43**). Alternatively, an individual may apply for a licence where the water use is not authorised under any other provision in the Act (**s40**). This latter situation is unlikely for most non-point sources, because these water uses are implicitly authorised under existing lawful water use. Furthermore, unless a non-point source is explicitly specified as a water use, even new developments are unlikely to apply. This is adequate, particularly in terms of reducing the administrative burden on water quality managers. Water use licences should only be used for priority non-point sources with severe impacts or those associated with water resources experiencing water quality problems[10].

4.4.3 Conditions and regulations on the use of water

Any ***conditions*** may be attached to the general authorisations or licences for water uses by the responsible authority (**s22(2)a**). This may be for non-point source specific water uses defined under Sections 21e, 21f or 21g, or possibly associated with other water uses[11]. Pertinent conditions for non-point sources may include:

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[8] The responsible authority is defined as the Minister or a catchment management agency to which that power or duty has been assigned (**s1xx**). This implies that where the responsible authority is specified, these functions may be delegated to the catchment management agency, such as general authorisations and conditions on water use.

[9] The Proposed General Authorisations (*Gov. Gazette*, 12 Feb 1999, pg 44-64) make specific reference to (and authorise) the following non-point sources related activities:
- Irrigation with waste water with certain water quality properties (2.7) on land with certain characteristics (2.9), and requires monitoring (2.10) and certain precautionary practices to be met (2.11).
- Storm-water runoff from non-industrial activities or premises (3.7(4) & 4.9(1e)).
- Disposal of mine residue from non-Category A mines (4.10), in accordance with specified regulations.
- Disposal of domestic waste water to on-site disposal facility, but requiring registration for residential areas of more than 5000 households or with density greater than 10 dwellings per hectare, that are served with on-site disposal sites (4.12(2)).

[10] It should be noted that a person may claim compensation where a compulsory water use license application for an existing lawful water use has been refused or restricted, leading to a severe economic consequence for an undertaking, except this is required to provide for the Reserve or to rectify unfair water use (**s22(6&7)**).

[11] For example, a condition requiring non-point source related management practices may be applied to an authorisation to abstract water for crop irrigation.

- Specifying management practices and general requirements for any water use (**s29(1)bi**).
- Requiring registration of water use under a general authorisation (**s29(1)bvi**).
- Specifying permissible quality levels or treatment for return flows, waste discharge or waste disposal (**s29(1)c**), which is relevant to non-point sources specified under 21f or 21g.
- Specifying the treatment, control and monitoring equipment to be installed, and management practices to be followed, to prevent the pollution of any water resource from controlled activities (**s29(1)d**).

Alternatively, the Minister may make ***regulations*** on water use (**s26**), possibly differentiating between different water resources (catchments), water resource classes or geographic areas (**26(2)**), and wastes with specific characteristics (**26(3)**). These may be required as part of general authorisations (**s39(1)**) or water use licences (**s41(3)**). However, regulations on water use may also be made independently of the need for a water use authorisation. The following clauses are appropriate for non-point source related regulations (**26(1)**):

c) requiring that any water use be registered with the responsible authority;
g) regulating or prohibiting any activity in order to protect a water resource or instream riparian habitat;
h) prescribing waste standards which specify the quantity, quality and temperature of waste which may be discharged or deposited into or allowed to enter a water resource;
i) prescribing the outcome or effect which must be achieved through management practices for the treatment of waste, or any waste class, before it is discharged or deposited into or allowed to enter a water resource.

The regulations may also outline the procedure and content of an assessment of the likely effect of a proposed licence on the quality of the water resource (**s26(1)o**), which is fundamental to the non-point source authorisation process.

Conditions and regulations on water use are therefore the fundamental statutory tools for proactive non-point source management.

4.4.4 Directives

The Act also allows a catchment management agency to direct any person who owns, controls or occupies land, upon which an activity or process is or was undertaken, to take specific measures to prevent pollution of a water resource (**s19**). This directive may indicate the time frame for commencing and completing the measure, and may control the relevant activity or prescribe management practices. If the measure is not adequately complied with, the catchment management agency may take action and recover the costs from the polluter and/or beneficiaries.

Directives are particularly applicable for site-specific management of non-point sources, where the general conditions and regulations of water use have not been properly implemented, or are not adequate to protect the resource quality.

4.5 Economic Instruments

Economic instruments are designed to influence decision-making behaviour by altering the costs and/or benefits of different activities. For non-point source management, this implies penalising activities which cause pollution and/or rewarding activities with positive or benign impacts, to ensure that resource use decisions take account of administrative and/or social-ecological costs or benefits. Economic instruments also enable individuals to be flexible in their management response, thereby encouraging innovative and locally appropriate solutions. However, the impacts of different economic instruments on decision making, and thus the reduction of non-point source pollution, are not well understood, and can cause unforeseen market distortions.

Registration and application fees may be required for general authorisations (**s29(1)vi**) and water use licences (**s40(3)**), respectively. These fees may be waived in deserving cases, particularly in order to redress past discrimination. Furthermore, the costs of any assessment to support a licence application may also be at the applicant's expense (**s41(2)a**). Although these fees should be related to the

administration or procedural costs, they do provide a slight impediment to unwarranted applications for exemptions.

Penalties (including fines) may be prescribed for offences in terms of regulation of water use (**s26(2)c**). Furthermore, the catchment management agency may recover costs incurred to implement measures where a directive has not been complied with (**s19(5)**). These penalties provide an economic tool to require non-point sources to comply with specified requirements.

The ***pricing strategy*** for water use charges may adopt differential rates for waste discharges, taking into account the extent of permitted deviation from prescribed waste standards or management practices (**56(5d)**). This would reflect the costs of water quality management for resource protection, required to fund water resource management **(56(2a)iv)**. Thus the pricing strategy potentially allows water use charges to be reduced (or increased) where specified management practices are implemented (or not implemented), in order to influence the adoption of statutory or voluntary management practices. This is relevant, because water use charges are charges on the land to which the water use relates (**s60(1)**).

It must be noted that these charges cannot be of such a nature as to constitute a tax, levy or duty (**s57(5)**), which restricts the application of *economic incentives* to influence actions. Thus the charges should reflect the administrative cots and management benefit associated with the management practice. Influencing decisions through *economic incentives* requires the co-operation of other government departments.

4.6 Co-operative Governance

As indicated in Chapter 3, land-use activities requiring non-point source management are often the mandate or competency of other government departments. The NWA recognises this by enabling a responsible authority to promote arrangements with other organs of state to combine their respective licence requirements (**s22(4)**). Furthermore, the requirements for a water use licence may be dispensed with where this is achieved by the grant of a licence, permit or other authorisation under any other law (**s22(3)**). Together these provisions may be used to promote co-operative governance, which is particularly relevant for non-point source management, and may involve, amongst others national, provincial local government departments involved in:

- environment (DEAT);
- land-use planning (e.g. L.A., DLA & DCD);
- municipal services (L.A.);
- agriculture (DoA);
- minerals and energy (DME);
- transport (DoT); and
- health (DoH).

A number of planning processes are required by national and provincial government, particularly for urban areas. These provide an important mechanism for influencing spatial land-use and infrastructure development, in order to mitigate the non-point source impacts of various land-use activities. In particular, the following processes should be engaged:

- Integrated Development Planning (IDP) under DCD;
- Land Development Objectives (LDO) under DLA;
- Water Services Development Plans (WSDP) under DWAF-WS;
- General Waste Management Plans (GWMP) under Provincial DEA;
- Hazardous Waste Management Plans (HWMP) under DEAT;
- Strategic Environmental Management Frameworks (SEMF) under DEAT; and
- Spatial Development Initiatives (SDI) under DTI.

5. CONSIDERATIONS IN SELECTING MANAGEMENT APPROACHES

5.1 General Considerations

A wide range of statutory and non-statutory mechanisms were outlined in the previous chapter for non-point source management. Each one may be appropriate under specific, differing circumstances. Key questions for non-point source management are: which approach is appropriate under particular conditions, and what issues need to be considered in order to develop control measures, as well as to manage their implementation.

The ultimate objective of the National Water Policy and the Act is to ensure equity, sustainability and efficiency of water use. These are also the basic considerations for all non-point source management approaches. However, more detailed considerations need to be identified for the following three issues:

- Selecting the approaches that should be used to manage different non-point sources/sectors.
- Determining the level (or scale) at which statutory non-point source management measures should be applied, including national, water management area, catchment, and site-specific, while taking account of the level of protection prescribed by the water resource class.
- Specifying the statutory requirements to manage non-point source related water uses, including the processing and evaluation of non-point source related water use licences.

5.2 Considerations in Selecting Non-point Source Management Approaches

In general, statutory measures should be used to manage those non-point sources with the greatest risk of causing water quality problems, with licensing only being required for those sources with the highest management priority. Thus, statutory authorisation of non-point sources should consider:

- the risk and severity of the potential impact;
- the extent of the problem and the consequences for sustainable use of water;
- the strategic, social or economic importance of the source/sector;
- the technical opportunities and economic constraints for non-point source management;
- the enforceability of a specific measure for a particular non-point source/sector, given the available capacity and resources of the regulatory authority.

On the other hand, non-statutory approaches are appropriate for non-point sources with less severe impacts, while co-operative governance approaches should be adopted where non-point sources are the mandate of other authorities. Table 5.1 highlights the most appropriate approaches (from Chapter 4) for managing the non-point source impacts associated with the sectors identified in Chapter 3.

5.3 Considerations for Identifying the Appropriate Level for Statutory Measures

Statutory non-point source management may be applied:

- generally at a national level;
- in a geographic area, such as water management areas or subcatchments;
- for different levels of protection, as defined by the water resource classification system; or
- to a specific non-point source, or activity associated with a particular site.

The advantages of detailed measures are that they may reflect site-specific conditions. Regulations and general authorisations will tend to be specified nationally or for geographical areas, possibly taking account of the resource class[12]. On the other hand, water use licences and directives are source related and should consider the specific conditions. The key considerations to determine the appropriate level are:

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[12] Although resource quality objectives may relate to the regulation or prohibition of instream or land-based activities, it is not clear that resource-directed measures are the appropriate mechanism to implement non-point source management. This approach confuses resource-directed protection of water resources with source-directed management or water use.

- the extent and severity of the problem at a national, regional or catchment scale;
- the risk to sustainable water use from degradation of a particular water resource;
- the administrative requirements for specifying more detailed measures; and
- the feasibility of assessing the needs for more detailed measures.

In general, statutory non-point source management measures should be developed nationally for water management areas, based on regulations and general authorisations. Site-specific water use licences should be prescribed for sources with potentially severe impacts, or those requiring an exemption. These sources should be audited to ensure compliance, supported by directives, and possibly legal action for those that are not complying. Only where these measures, together with the other non-statutory non-point source management approaches, are not adequate to meet the resource quality objectives for a particular resource, should more stringent general authorisations or water use licences be considered.

5.4 Specifying Statutory Requirements for Water Use

The specification of conditions or regulations on non-point source related water use must take consideration of a number of general issues (more detail is presented in Table 6.1), including the:

- *technical feasibility*[13] of a management practice and the scientific evidence that it mitigates the impact at the required level of protection, in terms of knowledge and expertise in South Africa;
- *economic viability*[14] of the requirement, reflecting its efficiency and affordability;
- *institutional capacity*[15] of the responsible authority and sector representatives to control and enforce the requirement, considering the nature of the non-point source/sector; and
- *social acceptability* of the requirement, given the social and political nature of the target group, the political will to address water quality impacts, and the issues of equity and redress.

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[13] Although management of any non-point source is possible, the technology required may not be widely available in South Africa, while the accuracy or reliability of assessments may be limited.

[14] Even where the technology is available, the benefit of its implementation should be greater than its cost (efficiency), and this should be affordable for the people involved in the relevant activity. For example, it may be possible to collect and treat storm-water runoff from residential areas, but this is usually not economically viable in situations of inadequate municipal services and limited affordability.

[15] Statutory requirements must be enforced, and conversely those that have little chance of enforcement, due to resource limitations, limited mandates or other impediments, should not be legislated until the conditions are appropriate. For example, the effective enforcement of fertiliser management practices on all vegetable crops throughout the country is unlikely, due to the difficulty in access to these lands, the unclear mandate for water quality managers, and limited human resource available.

Table 5.1. Possible management approaches[16] for each non-point source/sector

Non-point source/sectors	Persuasive Approaches	Statutory Measures					Co-op Govern: Other Acts	Economic Instr.
		Regulations	Gen. Auth.	Water use licence				
				Contr. Activ.	Waste Disch.	Waste Dispos.		
Agriculture							(DoA)	
livestock grazing	✔						✔	
dryland crops	✔						✔	
crop irrigation	✔	✔✔	✔		✔		✔	✔✔
pasture irrigation	✔	✔✔	✔				✔	✔✔
emerging farmers	✔						✔	✔
confined animal facilities		✔		✔	✔	✔	✔	
Forestry							(DWAF)	
indigenous forests	✔						✔	
plantations (exotic)	✔	✔✔	✔				✔	
woodlots	✔						✔	
Industry								
energy production	✔	✔✔	✔	✔✔	✔	✔		✔✔
heavy industry	✔	✔✔	✔	✔✔	✔	✔		✔✔
light industry	✔	✔✔	✔✔					✔
natural resource	✔	✔✔	✔✔					✔
Mining							(DME)	
coal mining	✔	✔✔	✔	✔✔	✔	✔	✔✔	✔
metal extraction	✔	✔✔	✔	✔✔	✔	✔	✔✔	✔
mineral extraction	✔	✔✔	✔✔	✔		✔	✔	✔
quarrying and sand	✔	✔✔	✔✔	✔		✔	✔	✔
Residential							(L.A.)	
formal residential	✔	✔✔	✔✔		✔		✔✔	✔
commercial	✔	✔✔	✔✔		✔		✔✔	✔
peri-urban informal	✔		✔✔				✔	✔
traditional rural	✔						✔	✔
small-holding	✔		✔✔				✔	✔
tourism resorts	✔	✔✔	✔	✔			✔	✔
recreational facilities	✔	✔✔	✔	✔			✔	✔
Transport							(DoT)	
highways	✔	✔✔					✔	
roads	✔	✔					✔	
railways	✔	✔✔	✔✔	✔		✔	✔	
airports	✔	✔✔	✔✔	✔		✔	✔	
harbours	✔	✔✔	✔✔	✔		✔	✔	
storage facilities	✔	✔✔	✔	✔✔	✔	✔	✔	
Waste Disposal							(DEAT)	
hazardous waste	✔	✔✔	✔	✔		✔✔	✔✔	
general solid waste	✔	✔✔	✔	✔		✔✔	✔✔	
sludge disposal	✔	✔✔	✔	✔✔		✔✔	✔✔	
effluent irrigation	✔	✔✔	✔	✔✔		✔		

✔ Possible approach for managing that non-point source type.
✔✔ Recommended approach for managing that non-point source type.

[16] The *national water resources strategy* and *catchment management strategies* have not been included in Table 5.1, because these are applicable to all non-point source sectors and provide the framework for the development and implementation of the other approaches.

Directives are applicable to any non-point source site (represented by a particular sector from the list in Table 5.1) where statutory measures are not being implemented or additional water resource protection is required. They should thus be viewed as a reinforcement or follow-up mechanism to the above approaches.

6. PROPOSED NON-POINT SOURCE AUTHORISATION FRAMEWORK

6.1 Introduction

The preceding discussion has highlighted the main issues that need to be incorporated into a framework for statutory non-point source authorisation. Such a statutory framework would have three generic elements:

- The development and implementation of management strategies, with a non-point source component.
- The promulgation of sectoral statutory measures for non-point source management.
- The implementation of the statutory measures, including licensing, control and enforcement.

The schematic presented in Figure 4.1 also reflects these three elements, as part of a total process of non-point source management. These elements are outlined in the following three sections, with an emphasis on the required processes and considerations for the different non-point source management measures. However, the detailed investigation should be done in the future project for which a Terms of Reference is presented in Chapter 7.

6.2 The Strategy Process

The national water resources strategy (NWRS) provides an opportunity to develop a framework for non-point source management in South Africa, with the necessary linkages to the other components, and particularly the resource protection and institutional arrangement components. These should set out the land-use activities that should be defined as water uses, in order to enable their statutory non-point source management. Furthermore, the NWRS should require a non-point source management plan to be developed as part of each catchment management strategy (CMS). The NWRS and CMSs should also outline a programme for promulgating and implementing statutory non-point source management measures for priority non-point source/sectors.

Thus, the NWRS and CMSs (together with the water resource classification and determination of resource quality objectives) provide the framework for non-point source management in South Africa and its implementation within WMAs. This must involve a programme for monitoring the water resources and auditing the implementation of both statutory and non-statutory non-point source management, resulting in a review of the strategies every five years, or revision of the statutory measures where the resource quality objectives are not being met. Table 6.1 indicates the process for establishing these strategies in law.

Water services development plans (WSDP) also provide an important vehicle for managing the impacts of service provision, particularly in terms of regulations, norms and tariffs. These should be consistent with the CMS developed in the water management areas within which the local authority is located.

6.3 Process for Promulgating Statutory Measures

Statutory non-point source management firstly requires the legislation of measures. The Act specifies the authority to promulgate each type of measure, presents the factors that must be considered, and outlines the process that must be followed. As indicated in Chapter 4, the mechanisms for statutory non-point source control are (not including *resource quality objectives* for land-based activities):

- *regulations* on water use;
- *general authorisations* on water use, possibly with conditions;
- licensing water use, as a *controlled activity*, *waste discharge* or *waste disposal*;
- *compulsory licensing* of water use in an area which has existing or imminent water quality problems;
- *directing* a person to comply with specified measures.

Although, the waste discharge (**s21f**) and waste disposal (**s21g**) definitions of water use may be applicable to non-point sources, the way in which these would be specified, given that the impacts on the water resource are predominantly due to the rainfall-runoff process, is not entirely clear. The approach used for streamflow reduction activities for water quantity is relevant in this regard. Land-use activities do not require permits until they have been declared as streamflow reduction activities (**s6(2)**). This implies that the statutory definition of a specific non-point source requiring authorisation through licensing, should be as a controlled activity (**s21e**). The use of the waste discharge and waste disposal definitions for non-point source management should rather be reserved for the general authorisations.

Table 6.2 highlights the authority, processes and considerations for promulgating the various statutory measures for non-point source management, at different scales. These factors should form the basis of procedures for assessment, selection and promulgation of appropriate management practices to manage priority non-point sources.

The statutory requirements should reflect the main lessons from the past, namely:

- The non-point source management approach should be as simple and streamlined as possible.
- Site-specific management should only be adopted where absolutely necessary.
- Ensure that the intent of the management approach is clear to polluters.
- Match management approaches to the non-point source character (i.e. source/sector-specific).

The following general scheme is recommended for developing statutory non-point management:

- Explore the requirements and possibilities for using co-operative governance for non-point source management, either under the National Water Act or other legislation.
- Enter a dialogue with the target sector to collaborate on the development of statutory or persuasive non-point source management measures for priority sources.
- Formulate national, regional (multi-WMA) or catchment-based general authorisations, with registration requirements and possibly conditions, for lower priority source types.
- Promulgate national or regional regulations requiring the implementation of management practices for priority source types, possibly associated with the declaration of a controlled activity.
- Develop the statutory requirements for general authorisations and regulations to protect the water resources but also fairly so that very few will request exemptions.
- Require national or regional licence applications for the highest priority sources or those that request an exemption from the general authorisations or regulations.
- Require compulsory water use licences for priority source types that pose a current or imminent threat to water quality in a particular catchment (sub-WMA).
- Use directives for site-specific non-compliance or severe localised water quality impacts.

6.4 Procedures for Implementing Statutory Measures

Statutory measures for non-point source management require control and enforcement to be effective. Thus, the third part of the framework revolves around the procedures for implementing the legislated measures, which are currently being developed. The implementation of statutory measures may be based on:

- compliance with the statutory regulations; or
- with specified conditions of general authorisations; or
- application for a water use licence; or
- exemption from compliance with a regulation or conditions.

This requires a number of activities, namely compliance, registration, licence application, appeal, review and enforcement. Table 6.3 indicates the statutory measures to which these are applicable, and outlines the factors and elements that should be considered in order to formulate procedures for their implementation, based on provisions in the National Water Act.

The Water Use Management Authorisation System (WARMS) provides the framework for these procedures. The generic procedures have been developed as part of the *Business Process Models* in the

WARMS, focusing on registration, licencing, water use charging, billing and monitoring and evaluation. They have already incorporated much of the information in Table 6.2 into a generic approach for all water use licensing. The WARMS will provide the link between statutory water use authorisation and the information and analysis systems incorporated in the Corporate GIS and the Water Management System (WMS).

An urgent requirement for the WARMS are the *Licence Application Guides*, which must be developed by the line function directorates, to indicate the requirements for registration and licence application for different water uses. The development of these Guides for non-point sources should be the focus of this component of the future project.

Table 6.1. Process and considerations for strategic non-point source management

Statutory Measures	Applicability	Legislation Process	Considerations
National Water Resources Strategy (national non-point source strategy)	**Minister** - national - regional/WMA	**Section 5(3) & 5(5)**: - established in phased manner - reviewed every 5 years - publish strategy/component - consider written comments - consider further steps - establish	**Section 6(1)**: - strategies, objectives, plans, guidelines, and procedures - protection, use, development, conservation, management and control - promote holistic and integrated management of water resources
Resource directed measures (class and RQOs)	**Minister** - resource class - WMA - subcatchment	**Section 13(4)**: - publish proposed class/RQOs - invite written comment - consider further steps - consider all comments	**Section 13(3)**: - proposed class and RQOs - geographic area and compliance dates - requirements for compliance
CM Strategy (catchment non-point source plan)	**CMA** - WMA - subcatchments	**Section 8(4) & 8(5)**: - established in phased manner - reviewed every 5 years - consult stakeholders - consent of the Minister - publish strategy/component - consider written comments - consider further steps - establish	**Section 9**: - reflect NWRS - strategies, objectives, plans, guidelines, and procedures - other national or regional plans
Water Services Development Plans	**Local Authority**	**Water Service Act (Act 108 of 1997: Section 14 & 15)**	**Water Service Act (Act 108 of 1997: Section 13)**

Table 6.2. Requirements and process for establishing statutory non-point source measures

Statutory Measures	Applicability	Legislation Process	Considerations
Regulations	**Minister** - national - regional/WMA	**Section 69(1)**: - publish regulation - invite written comments - consider further steps - consider all comments - publish - portfolio committee review	**Section 26(4)**: - economic and sustainable use - conserve and protect water resources - prevent wasteful water use - management of water use - monitoring of use and resources - imposition and recovery of charges
General Authorisations	**Responsible Auth.** - national - WMA - subcatchment	**Section 39(4)**: - publish area and use - invite written comments - consider further steps - consider all comments - publish	**Section 27(1)**: - existing lawful water use - redress past discrimination - efficient and beneficial water use - socio-economic impact of the use - catchment management strategies - effect on the resource or other users - class and resource quality objectives - investments already made - the strategic importance of the use - quality for the Reserve - quality for international obligations - duration of the undertaking
Waste Disposal or Waste Discharge	- national - WMA	As part of promulgating General Authorisations or Compulsory Licences	
Controlled Activities	**Minister** - national - WMA - site	**Section 38(3)**: - likely detrimental impact - publish activities/categories - invite written comments - inform interested parties - consider further steps - consider all comments - publish (with other activities)	
Compulsory Water Use Licences	**Responsible Auth.** - regional/WMA - subcatchment	**Section 43**: - publish notice	
Directives	**CMA** - site/source	**Section 19(3)**: - direct person who owns, controls or occupies land - take measures to remedy (if directive not complied with) - recover costs of measure	**Section 19(2)**: - cease, modify or control activity - comply with prescriptions - contain/prevent pollutant movement - eliminate sources of pollution - remedy the effects of pollution - remedy effects to habitat

Table 6.3. Requirements and process for implementing statutory non-point source measures.

Control	Statutory Measures	Procedural Considerations
Compliance	- general authorisations - regulations	- self-regulated compliance
Registration	- general authorisations - regulations	**Section 26(1)c & 29(1)iv**: - complete registration form - payment of registration fee
Licence Application	- controlled activity - compulsory licence - unauthorised water use - exemption from gen. auth. - exemption from regulations	**Section 41** (may include) - complete application form - payment of application fee - other information - assessment of impact on resource - independent review - investigation by responsible authority - give notice in media and to organs of state - request written comments - EIA required by DEAT - decision and conditions
Licence Appeal	- restricted or refused application for compulsory licence for existing lawful water use	**Section 22**: - show economic prejudice - lodge compensation claim with Water Tribunal - W.T. determines liability - negotiate for payment or reallocate
Licence Review	- water use licence (at stipulated time period)	**Section 49**: - evaluation of quality, quantity & socio-economic conditions - proposed amendment, relating to similar water use - licensee hearing - amendment and re-issue, except time period of licence - possible compensation if restricted
Monitoring and Auditing Water Use	- general authorisations - regulations - water use licences	**Section 26(b) & 29(1)bii**: - monitor, measure and/or record water use - audit compliance with regulations or conditions on water use
Enforcement	- any site or activity - general authorisation - regulation - water use licence	- directive, action and/or cost recovery (**s19**) - notice to comply, action & cost recovery, prosecution (**s53**) - licence restriction, suspension or withdrawal (**s54**)

7. THE WAY FORWARD

7.1 Introduction

It is proposed that the future development and implementation of non-point source management by DWAF is conducted in two sequential phases, namely *strategy formulation* and *strategy implementation*, as outlined in the following two sections. The rationale for this is that:

- non-point source input to the national water resource strategy (NWRS) is urgently required, supported by a series of procedures and guides for non-point source management;
- the water use authorisation management system (WARMS) urgently requires licence application guides for its further development; and
- the actual implementation of non-point source management (including the development and consultation of management measures) is a lengthy process which should not delay the above tasks.

7.2 Formulation of the Strategy and Guides

This phase consists of three main components. These should be conducted concurrently, due to the requirement for significant integration and feedback between the strategies, procedures and guides. This is an urgent component of the water law implementation, which should be conducted over a period of about nine months, to be completed by mid-2000.

National non-point source strategy as part of the national water resource strategy

The establishment of the national water resource strategy (NWRS) provides an invaluable opportunity to formulate a national non-point source strategy (NNPSS). This would set out DWAF's intentions for non-point source management in South Africa over the next five years and the requirements of water management institutions, sectors and stakeholders. It is assumed that a point source management strategy will also be developed, either as part of this NNPSS process or with significant communication and integration around the approach[17].

The NNPSS should extend the preliminary framework presented in this discussion paper, based on further consultation of key DWAF personnel and selected stakeholders. The NNPSS should focus on the following important tasks:

- Identifying the requirements, content and form of the NWRS, and the implications for the NNPSS.
- Identify the requirements of the water resource classification system and determination of resource quality objectives, in terms of non-point source management.
- Developing the relationship between the NNPSS and other components of the NWRS, particularly the resource protection, point source management and water pricing strategies.
- Revising and refining the preliminary framework for non-point source management outlined in Figure 4.1 of this discussion paper.
- Exploring which non-point source management approaches are appropriate under different conditions, including persuasion, regulation, pricing and co-operative governance.
- Detailing the considerations for adopting alternative statutory measures for non-point source control, including general authorisations, regulations, water use licensing and directives.
- Fostering and implementing co-operative governance arrangements.
- Developing regional considerations for non-point source management.
- Specifying the requirement for a non-point source management strategy within a water management area (WMA) as part of every catchment management strategy (CMS).

This final point is possibly the most crucial element of the NNPSS. Fortunately, this issue should be addressed by the D:WQM project on the *Development of guidelines for conducting catchment water quality management projects*. In particular, it should explore the relationship between the catchment

[17] The needs and focus of the NNPSS differs from a point source strategy in the emphasis on co-operative governance and non-statutory persuasive approaches, even though the general approaches should be the similar.

non-point source strategy and other statutory and non-statutory non-point source management measures implemented at a WMA or catchment level. Furthermore, it should outline a procedure for developing and implementing a catchment non-point source management strategy as part of the CMS.

Procedural guides

The NNPSS must be supported by the development of procedures and guides for the promulgation of statutory non-point source management measures, as well as the implementation of non-statutory non-point source management approaches. These procedural guides should primarily be targeted at water quality management personnel in DWAF and catchment management agencies. However, they should also be relevant for all stakeholders, particularly non-point source sector representatives and staff in other organs of state that may be involved in the development and implementation of non-point source management.

Statutory procedural guides should be based on the considerations and processes outlined in Chapters 5 and 6 of this paper, and should be developed for:

- *Regulations* on a national or WMA level.
- *General authorisations* at a national, WMA or catchment scale.
- Declaring non-point sources as *controlled activities*, *waste disposal* or *waste discharge* requiring *water use licences*, either as a national/regional licence or catchment-based compulsory licences requirement.
- Requiring non-point source conditions on water use authorisations (general authorisation or water use licence) other than those defined above (i.e. not non-point source specific).
- Formulating and issuing a *directive* for a particular site, and possibly implementing an action and recovering costs.

Non-statutory procedural guides should be developed for:

- *Persuasive* approaches to encourage collaboration with non-point source sectors to develop management approaches that may be incorporated into statutory measures or catchment management strategies.
- *Co-operative governance*, particularly to guide and facilitate the fostering of collaborative partnerships with other organs of state responsible for or involved in non-point source related sectors.
- *Water use pricing*, outlining the way in which the pricing strategy may be used to encourage adoption of proactive non-point source management approaches.

The framework outlined in the NNPSS would indicate when each of these procedural guides is appropriate and should be used.

Licence application guides

The generic registration, licensing and water use charging processes have been outlined in the *Business Process Models* as part of the WARMS, and these do not need to be duplicated. However, these models need to be interpreted from the non-point source perspective, in order to identify the elements that are important for non-point source management

This analysis should inform the development of *licence application guides* for non-point source related water use authorisation, as support to the WARMS. These guides should:

- specify the information that is required to support the non-point source versions of the business process models, particularly for registration, licence application, appeal, review, water use charging, billing, and monitoring and evaluation; and
- provide guidance on how to obtain this information, including relevant data sources and the types or character of assessment techniques that may be useful, possibly by sector; the *Guide to Non-point Source Assessment* (Pegram *et al.*, 1999) provides an appropriate reference for this.

7.3 Strategy Implementation

The implementation phase should follow on from the strategy formulation phase, and consists of two main components. These components should be conducted concurrently over a period of two to three years, in order to allow adequate stakeholder consultation and sectoral involvement.

Strategic plan of implementation

An implementation plan should be developed, which outlines the priority non-point source sectors (and activities), target outputs and activities, responsibilities and time-frame for implementing the NNPSS. The details of these requirements will become clear during the strategy formulation phase.

Sectoral engagement

It is absolutely critical to the success of non-point source management that the strategies, procedures and guides (developed during the first phase) be applied to and evaluated for the highest priority non-point source sectors, possibly in critical WMAs. The dual objectives of this implementation should be:

- to implement non-point source management in accordance with the NNPSS, and
- to test and refine the strategy, procedures and guides.

This implementation should be done in collaboration with the relevant institutions, sectors and stakeholders, and thus will require an extensive and extended consultation and participation process. The sectoral implementation should be designed to address the lessons learned from past water quality management experience (see Chapter 2):

- The non-point source management approach should be as simple and streamlined as possible.
- Ensure that the intent of the management approach is clear to polluters.
- Match management approaches to the non-point source character (i.e. source/sector-specific).
- Site-specific management should only be adopted where absolutely necessary.
- Reflect the "cradle-to-grave" philosophy of environmental management.

A significant effort should be placed on mobilising the priority non-point source sectors and ensure their involvement, collaboration and possible financial support. This mobilisation should be started early, and thus requires attention during the strategy formulation phase.

8. REFERENCES

DWAF (1991) **Water Quality Management Policies and Strategies in the RSA**. Pretoria

DWAF (1995) **Procedures to Assess Effluent Discharge Impacts**. Pretoria

DWAF (1997) **White Paper on a National Water Policy for South Africa**. Pretoria.

DWAF (1999) **Managing the Water Quality Effects of Settlements: The National Strategy**. DWAF Water Quality Management Series. Policy Document U1.1. Pretoria.

Pegram, GC, AHM Görgens and G Quibell (1999) **A Guide to Non-point Source Assessment: to Support of Water Quality Management of Surface Water Resources in South Africa**. forthcoming WRC Report.

Van der Merwe, W and D Grobler (1990) "Water quality management in the RSA: Preparing for the future," **Water SA**. Vol 16 (1).